AMENDMENTS TO SPECIFICATION

Page 1 – Please replace the second paragraph, which bridges to page 2, line 2, with the amended paragraph as follows:

Thin film transistors (TFT) used for image displays in the prior art have been formed using, as a device material, polycrystalline silicon formed by a melting recrystallization method such as excimer laser annealing from amorphous silicon or microcrystalline silicon formed by a plasma CVD process on an insulative substrate such as glass or quartz as a base material.

Page 3 – Please replace the second full paragraph with the amended paragraph as follows:

A gate insulation film 208 such as a silicon oxide film is disposed on the polycrystalline silicon thin film 205. Further, a source impurity implantation region 207 and a drain impurity implantation region ~~206~~ 209 are formed on the polycrystalline silicon thin film 205. A thin film transistor is formed by disposing a gate electrode on the source - impurity implantation regions 207 and 209 and the gate insulation film 208.

Page 7 – Please replace the first full paragraph with the amended paragraph as follows:

This invention is an invention adopting a crystallization method based on the suitable shape selection laser energy density Ec by the finding described above, which defines the crystal grains in the polycrystalline semiconductor thin film as the hexagonal shape and defines the rate of the hexagonal shape to be 50 – 100%.

Page 10 – Please replace the last paragraph, which bridges to page 11, line 2, with the amended paragraph as follows:

(4) An electronic apparatus incorporating a semiconductor device in which plural

transistors are formed in a polycrystalline semiconductor thin film, wherein the electronic apparatus is, for example, a data processor in which a central processing unit, a ~~cash~~ cache circuitry, a memory circuitry, a peripheral circuitry, an input/output circuitry and a bus circuitry are formed with each of the transistors of the semiconductor device.

Page 11 – Please replace the last paragraph, which bridges to page 12, line 6, with the amended paragraph as follows:

(d) Since laser beam irradiation is conducted repeatedly by multiple cycles at the suitable shape selection laser energy density Ec most preferred for forming the hexagonal shape, hexagonal shape crystals are formed successively in the amorphous semiconductor film, adjacent hexagonal crystal grains move to each other and are gradually in close contact with adjacent hexagonal crystal grains. Subsequently, since laser beam irradiation is conducted repeatedly for multiple cycles at a laser energy density lower than the suitable shape selection energy density Ec, less impurities ~~less~~-segregate to the grain boundaries to make the carrier concentration of the crystal grains constant.

Page 12 – Please replace the paragraph beginning on line 15 thereof with the amended paragraph as follows:

(b) In each of the transistors, the density of the grain boundaries present in the silicon channel region below the gate electrode ~~less~~-varies less and the threshold voltage V_{th} is made uniform in each of the transistors.

Page 12 – Please replace the paragraph beginning on line 19 with the amended paragraph as follows:

(c) Since the laser beam is irradiated repeatedly upon forming the polycrystalline semiconductor thin film, roughness on the surface of the polycrystalline semiconductor thin film is reduced and variation in the performance of individual transistors is reduced and less

degradation ~~less~~ occurs to attain the longer life of the transistors.

Page 12 – Please replace the paragraph beginning on line 25 thereof and bridging to page 13, line 13, with the amended paragraph as follows:

(d) In the formation of the polycrystalline semiconductor thin film, since laser beam irradiation is conducted repeatedly for multiple cycles at the suitable shape selection laser energy density Ec most preferred for forming the hexagonal shape, hexagonal seed crystals are formed successively in the amorphous semiconductor film, adjacent hexagonal crystal grains move to each other and are gradually in close contact with adjacent hexagonal crystal grains. Subsequently, since laser beam irradiation is conducted repeatedly for multiple cycles at a laser energy density lower than the suitable shape selection energy density Ec, less impurities ~~less~~ segregate to the grain boundaries to make the carrier concentration of the crystal grains constant. As ~~the~~ a result characteristics of the transistors become stable.

Page 13 – Please replace the last paragraph with the amended paragraph as follows:

According to the constitution (4) described above, since the central processing unit, the ~~cash~~ cache circuitry, the memory circuitry, the peripheral circuitry, the input/output circuitry and the bus circuitry are formed with the thin film transistors formed on the glass substrate surface, it is possible to provide a data processor of reduced thickness and higher performance.

Page 22 – Please replace the first full paragraph with the amended paragraph as follows:

In the first laser irradiation, when laser beam irradiation is applied repeatedly by once or a predetermined number of cycles, hexagonal crystal grains are formed successively as crystal grains and, subsequently, they continue to rotate or move as shown in Fig. 9(a) and then respective sides of adjacent hexagonal crystal grains meet each other as shown in Fig. 9(b). Further, according to the laser beam irradiation, less impurities ~~less~~ segregate to the boundaries

of the crystal grain and the carrier concentration of each of the crystal grains becomes constant.

Page 26 – Please replace the first full paragraph with the amended paragraph as follows:

Further, when the polycrystalline semiconductor thin film 640 is formed, since the laser beam irradiation is applied repeatedly for multiple cycles at the suitable shape selection laser energy density Ec most preferred for forming the hexagonal shape, hexagonal seed crystals are successively formed in the amorphous semiconductor film and adjacent hexagonal crystal grains move to each other and are successively in close contact with adjacent hexagonal crystal grains 251. Subsequently, since the laser beam irradiation is applied repeatedly for multiple cycles at a laser energy density lower than the suitable shape selection laser energy density Ec, less impurities ~~less~~ segregate to the grain boundary and the carrier concentration is made constant for each of the crystal grains.

Page 26 – Please replace the paragraph beginning on line 20 thereof and bridging to page 27, line 7, with the amended paragraph as follows:

Then, a method of manufacturing a thin film transistor is to be explained. For example, as shown in Fig. 11(a), an insulative substrate (glass substrate) 602 having a polycrystalline semiconductor thin film (polycrystalline silicon film) 640 at the surface is provided. The example of Fig. 11 has a structure in which a silicon oxide film 651 is placed as a buffer layer between the insulative substrate 602 and the polycrystalline semiconductor thin film 640, different from the polycrystalline semiconductor thin film substrate 260 shown in Fig. 3. While the buffer layer may be ~~saved~~omitted, this Embodiment 1 is to be explained for the method of manufacturing a thin film transistor in a polycrystalline semiconductor thin film substrate 260 having the buffer layer.

Page 27 – Please replace the paragraph beginning on line 17 thereof with the amended

paragraph as follows:

Then, as shown in Fig. 11(b), selective etching is applied to extend impurity regions 671 each of a predetermined length on both sides of the channel ~~regions~~region 672.

Page 28 – Please replace the first full paragraph with the amended paragraph as follows:

Then, as shown in Fig. 10, after forming an interlayer insulation film 675 over the entire region of the upper surface of the insulative substrate 602, contact holes are opened to form electrodes (source electrode, drain electrode) 676 to be connected with the impurity region 671 or not illustrated gate wiring electrode. Further, although not illustrated, the transistor is covered with a passivation film and a portion of the passivation film is removed to expose an external electrode.

Page 28 – Please replace the paragraph beginning on line 17 thereof and bridging to page 29, line 1, with the amended paragraph as follows:

In the transistor according to this Embodiment 1, ~~since~~ 50% to 100% of the crystal grains of the polycrystalline semiconductor thin film 640 comprise hexagonal crystal grains 251 and the grain diameter is uniform as 0.2 to 0.3 μm. Accordingly, when a transistor (TFT) is formed, the grain boundaries in the channel region of silicon below the gate electrode are reduced and the carrier mobility μ is improved and variation in the carrier mobility is decreased for each of the transistors. The carrier mobility μ can be enhanced, for example, to about 200 - 300 $cm^2/V \cdot s$.

Page 29 – Please replace the paragraph beginning on line 8 thereof with the amended paragraph as follows:

Further, since the laser beam is irradiated repeatedly when the polycrystalline semiconductor thin film 640 is formed, the roughness on the surface of the polycrystalline

semiconductor thin film is reduced, and variation in the performance is decreased for each of the individual transistors and less degradation ~~less~~ occurs to attain longer life of the transistor.

Page 29 – Please replace the paragraph beginning on line 15 and bridging to page 30, line 3, with the amended paragraph as follows:

Further, when the polycrystalline semiconductor thin film 640 is formed, since the laser beam irradiation is applied repeatedly by multiple cycles at a suitable shape selection laser energy density Ec for forming the hexagonal shape, hexagonal seed crystals are formed successively and adjacent hexagonal crystal grains move to each other and are in close contact with adjacent hexagonal crystal grains successively. Subsequently, laser beam irradiation is applied repeatedly for multiple cycles at a laser energy density lower than the suitable shape selection laser energy density Ec. Accordingly, less impurities ~~less~~ segregate in the grain boundaries and the carrier concentrations are made constant for each of the crystal grains. As a result, characteristics of the transistor become stable.

Page 30 – Please replace the paragraph beginning on line 12 thereof with the amended paragraph as follows:

In this embodiment, since the crystal grains in the polycrystalline semiconductor thin film are formed as the hexagonal crystal grains of uniform size, the carrier mobility is high and it ~~less~~ varies less and, ~~as well as~~ the threshold voltage V_{th} ~~less~~ varies less. Accordingly, when plural transistors are manufactured, characteristics ~~less~~ scatter less for each of the transistors and the manufacturing yield of semiconductor devices can be improved. As a result, the manufacturing cost of the semiconductor device can be reduced.